

ABSTRACT OF THE DISCLOSURE

Catalysts useful for oxidation reactions are disclosed. The catalysts comprise a titanium zeolite, a transition metal, and a polymer, wherein at least one of the titanium zeolite or transition metal is
5 encapsulated within a thin layer of the polymer. The catalysts are easy to prepare and use, they are easy to recover and reuse, and they provide good conversions in a variety of important oxidation processes, including propylene epoxidation. The invention includes a process which comprises oxidizing an organic compound in the presence of hydrogen,
10 oxygen, and the catalyst, wherein the transition metal catalyzes formation of hydrogen peroxide in situ.